

Applicants respectfully submit that neither Herrera and Faroudja, whether considered alone or in combination, disclose, teach or suggest, either explicitly or implicitly, Applicants' claimed subject matter, and more specifically, fail to disclose, teach or suggest Applicants' claimed subject matter in claims 1-23.

Herrera is directed to a method and apparatus for processing DVD video. More specifically, Herrera discusses the modification of a 3D graphics accelerator to support MPEG-2 video decoding in a computer system for playing back a DVD data stream. (Abstract). Herrera further states that the modification of the 3D graphics accelerator allows for YUV 4:2:0 to YUV 4:2:2 conversion. (Id). In support of making such a modification to the 3D graphics processor, Herrera specifically notes the similarity between the YUV 4:2:0-to-4:2:2 conversion process and certain 3D texture mapping processes typically supported by most 3D engines. (col. 10, lns. 20-27). Herrera does not disclose, teach or suggest, whether considered alone, or in view of Faroudja, Applicants' method for de-interlacing interlaced video using a graphics processor.

Faroudja is directed to universal video disc record and playback employing motion signals for high quality playback of non-file sources. More specifically, Faroudja includes, inter alia, the recording and transmission, in progressively-scanned video, of interlaced video. (col. 2, lns. 19-27). Further, Faroudja discloses the conversion of an interlaced video into a progressively-scanned video source using a conventional standards converter 12 and the data rate compressor 14. (FIG. 3; col. 6, lns. 51-67). Faroudja does not disclose, teach or suggest, whether considered alone, or in view of Herrera, Applicants' method for de-interlacing interlaced video using a graphics processor.

Independent Claim 1

Applicants note Examiner's statement that Herrera does not disclose that a 2-D/3-D engine is used for adaptively de-interlacing a frame image from at least a first interlaced field.

(Office Action, ¶ 2, pg. 2). However, the Office Action attempts to equate Applicants' "receiving at least one instruction for a 2-D/3-D engine to facilitate creation of an adaptively de-interlaced frame image from at least a first interlaced field," (Claim 1), with Herrera's language of col. 10, lns. 16-49. (Office Action, ¶ 2, pg. 2). Applicants respectfully submit that the particular language of Herrera identified by the Office Action simply describes the use of 3D engines to achieve the DVD and/or MPEG-2 related processing of motion process compensation and conversions between different digital video formats, namely, YUV 4:2:0 and 4:2:2 formats, and as such, Herrera does not disclose, teach or suggest the use of 2-D/3-D engines for de-interlacing, more specifically to Applicants' above identified claimed subject matter.

Regarding conversion, Herrera discusses the conversions between: YUV 2:2:0 and YUV 4:2:2; YUV 4:2:2 and RGB; and RGB and an analog signal to be displayed on a display device. (col. 5, lns. 49-64). Herrera also discusses the conversion of vertex information into triangle information, determining digital pixel data for the triangle, and modifying the digital pixel data based on the triangle information and a digital texture map. (col. 6, lns 2-7). As such, Applicants respectfully submit that Herrera is limited to disclosing the use of 3D engines to manipulate DVD and MPEG information, and in so doing, Herrera does not disclose, teach or suggest the use of 2-D/3-D engines in connection with de-interlacing techniques. More specifically, Herrera does not discuss the use of 3D engines to generate a de-interlaced frame image from an interlaced field. As such, Applicants respectfully submit that Herrera., whether considered alone, or considered in combination with Faroudja, fails to disclose, teach or suggest Applicants' claim 1 subject matter including, inter alia, "receiving at least one instruction for a 2-D/3-D engine to facilitate creation of an adaptively de-interlaced frame image from at least a first interlaced field; and performing, by the 2-D/3-D engine, at least a portion of adaptive de-

interlacing based on at least the first interlaced field in response to the at least one instruction to produce at least a portion of the adaptively de-interlaced frame image” (claim 1).

Next, the Office Action attempts to equate Applicants’ production of a “de-interlaced frame image from at least a first interlaced field,” (Claim 1), with Faroudja’s language of col. 2, lns. 20-35. (Office Action, ¶ 2, pg. 2). Applicants respectfully submit that the particular language of Faroudja identified by the Office Action simply describes a recording and transmission system in which an interlaced video source is recorded or transmitted as progressively-scanned video along with a real-time motion signal. (col. 2, lns. 20-35). More specifically, FIG. 3 shows the input of an interlaced source into a conventional standards converter 12 and the output of the standards converter 12 then processed by a data rate compressor 14 to produce the final video output. (FIG. 3; col. 6, lns. 51-67). In sum, Faroudja does not disclose, teach or suggest any use of 2-D/3-D engines, or any other non-standard transformation techniques, in transforming an interlaced field into a de-interlaced frame image. As such, Applicants respectfully submit that Faroudja., whether considered alone, or considered in combination with Herrera, does not disclose, teach or suggest Applicants’ claim 1 subject matter including, inter alia, “receiving at least one instruction for a 2-D/3-D engine to facilitate creation of an adaptively de-interlaced frame image from at least a first interlaced field; and performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing based on at least the first interlaced field in response to the at least one instruction to produce at least a portion of the adaptively de-interlaced frame image.” (claim 1).

Applicants note that court decisions have held that in order for prior art references to be combined by obviousness, at a minimum, there must be a suggestion of desirability for the modification. *In re Fritch*, 922 F.2d 1260, 23 USPQ 2d 1780 (Fed. Cir. 1992). The CAFC has held that the motivating suggestion must be explicit. *Winner International Royalty Corp. v.*

Wang, 48 USPQ 2d 1139 (D.C. Dist. Ct. 1998), *aff'd*, 98-1553 slip op. (Fed. Cir. 2000). Neither *Herrera* or *Faroudja*. suggest a desirability for modification, explicit or otherwise. Additionally, since none of the cited references teach or suggest the use of a 2-D/3D engine to facilitate creation of an adaptively de-interlaced frame image from at least a first interlaced field, the combination of any of the cited references cannot produce the Applicants' invention as claimed.

Dependent Claim 2

Applicants respectfully reassert the arguments made above regarding claim 1. Applicants also submit that the storing of 2D images described in *Herrera* are images that were never interlaced to begin with, and as such the storage of such images do not disclose the storage of a de-interlaced frame image. Applicants direct the Examiner's attention to Applicant's arguments regarding claim 1 and submit that because *Herrera* does not disclose an "at least portion of adaptively de-interlaced frame image" that is produced by "performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing based on at least the first interlaced field," (claim 1), that *Herrera* can not, and does not disclose, teach or suggest, Applicants' claim 2 subject matter of "storing the at least portion of the adaptively de-interlaced frame image for display."

Further, Applicants submit that because claim 2 depends from claim 1, and as a dependent claim therefrom, claim 2 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 2 is also allowable in light of the presence of novel and non-obvious elements contained in claim 2 that are not otherwise present in claim 1.

Dependent Claim 3

Applicants respectfully reassert the arguments made above regarding claims 1 and 2. Further, as discussed above regarding claim 2, because *Herrera* does not disclose, teach or

suggest, inter alia, an “at least portion of adaptively de-interlaced frame image frame image” that is produced by “performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing based on at least the first interlaced field,” (claim 1), that Herrera can not, and does not disclose, teach or suggest, Applicants’ claim 3 subject matter of “retrieving, by a graphics processor display engine, the stored adaptive de-interlaced frame image for display on at least one display device.”

Further, Applicants submit that because claim 3 depends from claim 2, and as a dependent claim therefrom, claim 3 is allowable for at least the reasons claim 2 is allowable. Applicants further submit, argued in part at least immediate above, that claim 3 is also allowable in light of the presence of novel and non-obvious elements contained in claim 3 that are not otherwise present in claim 2.

Dependent Claim 4

Applicants respectfully reassert the arguments made above regarding claim 1. Further, because neither Herrera or Faroudja disclose, teach or suggest, whether considered alone or in combination, Applicants’ claimed subject matter including, inter alia, “performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing,” (claim 1), neither Herrera or Faroudja, alone or in combination, can or do disclose, teach or suggest, Applicants’ claim 3 subject matter of “wherein the step of performing adaptive de-interlacing by the 2-D/3-D engine includes executing 2D/3D instructions that result in performing media filtering.” In response to the Office Action’s argument that median filtering is known to those of ordinary skill in the art, and therefore it would have been obvious to incorporate the median filter into Herrera’s system to achieve Applicants’ claimed subject matter, Applicants submit that the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish prim facie obviousness. (MPEP 2143.01, pg. 2100-124). Nor can the level of skill in

the art be relied upon to provide the suggestion to combine references. (Id). Further, Applicants further submit, that even if such median filtering was incorporated into Herrera's disclosed system, one would still not be in possession of Applicants' claimed subject matter (see arguments above regarding how Applicants' claim 1 subject matter is not disclosed, taught or suggested by the cited art).

Further, Applicants submit that because claim 4 depends from claim 1, and as a dependent claim therefrom, claim 4 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 4 is also allowable in light of the presence of novel and non-obvious elements contained in claim 4 that are not otherwise present in claim 1.

Dependent Claim 5

Applicants respectfully reassert the arguments made above regarding claims 1 and 4. As discussed above regarding claim 4, neither Herrera or Faroudja disclose, teach or suggest, Applicants' "performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing," (claim 1), and therefore neither Herrera or Faroudja, alone or in combination, can or do disclose, teach or suggest, Applicants' claim 3 subject matter of "wherein the step of performing adaptive de-interlacing by the 2-D/3-D engine includes executing 2D/3D instructions that result in performing spatio-temporal filtering." In response to the Office Action's argument that spatio-temporal filtering is known to those of ordinary skill in the art, and therefore it would have been obvious to incorporate the median filter into Herrera's system to achieve Applicants' claimed subject matter, Applicants again submit that the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish prim facie obviousness. (MPEP 2143.01, pg. 2100-124). Again, Applicants also note that the level of skill in the art cannot be relied upon to provide the suggestion to combine references. (Id). Further,

Applicants further submit, that even if such spatio-temporal filtering was incorporated into Herrera's disclose system, one would still not be in possession of Applicants' claimed subject matter (see arguments above regarding how Applicants' claim 1 subject matter is not disclosed, taught or suggested by the cited art).

Further, Applicants submit that because claim 5 depends from claim 1, and as a dependent claim therefrom, claim 5 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 5 is also allowable in light of the presence of novel and non-obvious elements contained in claim 5 that are not otherwise present in claim 1.

Dependent Claim 6

Applicants respectfully reassert the arguments made above regarding claim 1. As discussed above regarding claims 1, 4 and 5, neither Herrera or Faroudja disclose, teach or suggest, Applicants' "performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing." Therefore, such cited art also does not disclose, teach or suggest "controlling the 2-D/3-D engine to perform the adaptive de-interlacing prior to display by the display engine." (Claim 6). Further, the language of Herrera cited by the Office Action identifies only the conversion between YUV 4:2:0 to YUV 4:2:2, and does not make any reference to Applicants' de-interlacing technique. Again Applicants' submit that neither Herrera alone, or Herrera in view of Faroudja, does not disclose, teach or suggest Applicants' claimed subject matter.

Further, Applicants submit that because claim 6 depends from claim 1, and as a dependent claim therefrom, claim 6 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 6 is also allowable in light of the presence of novel and non-obvious elements contained in claim 6 that are not otherwise present in claim 1.

Dependent Claim 7

Applicants respectfully reassert the arguments made above regarding claim 1. In addition, and as discussed above regarding claims 1, 4 and 5, neither Herrera or Faroudja disclose, teach or suggest Applicants' claimed subject matter, including, inter alia, "performing, by the 2-D/3-D engine, at least a portion of adaptive de-interlacing." Therefore, such cited art also cannot, and does not disclose, teach or suggest "issuing 2D/3D instructions to the 2D/3D engine to carry out the de-interlacing of lines of video data from interlaced fields." (Claim 7). Again, the language of Herrera cited by the Office Action identifies only the conversion between YUV 4:2:0 to YUV 4:2:2, and does not make any reference to Applicants' de-interlacing techniques. Again Applicants' submit that neither Herrera alone, or Herrera in view of Faroudja, does not disclose, teach or suggest Applicants' claimed subject matter.

Further, Applicants submit that because claim 7 depends from claim 1, and as a dependent claim therefrom, claim 7 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 7 is also allowable in light of the presence of novel and non-obvious elements contained in claim 7 that are not otherwise present in claim 1.

Dependent Claim 8

Applicants respectfully reassert the arguments made above regarding claim 1. Further, the language of Herrera that the Office Action equates with Applicants claim 8, namely col. 10, lns. 44-49, discusses operations not instructions. More specifically, the cited language discusses motion compensation, YUV conversion, alpha blending, but does not disclose, teach or suggest "the at least one instruction includes at least one of a: line inverting instruction, a scaling instruction and a blend instruction." (Claim 8). Further, as stated in claim 1, since the "at least one instruction" is to be executed by the "2D/3D engine" for the purpose of creating "an

adaptively de-interlaced frame image from at least a first interlaced field,” (claim 1), and since, as described argued above regarding claim 1, Herrera does not discuss a 2D/3D engine that generates a de-interlaced frame image from an interlaced field, Applicants therefore submit that Herrera does not disclose, teach or suggest, whether considered alone, in or in combination with Faroudja, a 2D/3D engine receiving instructions of claim 8 for the purpose of “facilitat[ing] creation of an adaptively de-interlaced frame image from at least a first interlaced field,” (claim 1).

Further, Applicants submit that because claim 8 depends from claim 1, and as a dependent claim therefrom, claim 8 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 8 is also allowable in light of the presence of novel and non-obvious elements contained in claim 8 that are not otherwise present in claim 1.

Dependent Claim 9

Applicants respectfully reassert the arguments made above regarding claim 1. Again, the Office Action cites language only from Herrera as the source of disclosure that would render Applicants’ claim 9 obvious in further light of Faroudja. However, neither Herrera alone, or Herrera in view of Faroudja, disclose, teach or suggest the operation of de-interlacing with respect to a 2D/3D engine, (see arguments regarding claim 1). Therefore, the “at least one instruction” intended “for a 2-D/3-D engine to facilitate creation of an adaptively de-interlaced frame image from at least a first interlaced field,” claim 1, is not disclosed by Herrera, or Herrera in view of Faroudja. As such, Applicants submit that Applicants claim 9 subject matter including “determining whether the at least one instruction is for the 2D/3D engine or for a display engine” is not disclosed, taught or suggested by either Herrera or Herrera in light of Faroudja.

Further, Applicants submit that because claim 9 depends from claim 1, and as a dependent claim therefrom, claim 9 is allowable for at least the reasons claim 1 is allowable. Applicants further submit, argued in part at least immediate above, that claim 9 is also allowable in light of the presence of novel and non-obvious elements contained in claim 9 that are not otherwise present in claim 1.

Independent Claim 10

The Office Action states that “Claim 10 is rejected for the same reasons as discussed in claims 1, 3 and 9 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claims 1, 3 and 9.

Dependent Claim 11

The Office Action states that “Claim 11 is rejected for the same reasons as discussed in claim 2 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claim 2. Further, Applicants submit that because claim 11 depends from claim 10, and as a dependent claim therefrom, claim 11 is allowable for at least the reasons claim 10 is allowable. Applicants further submit, argued in part at least immediate above, that claim 11 is also allowable in light of the presence of novel and non-obvious elements contained in claim 11 that are not otherwise present in claim 10.

Dependent Claim 12

The Office Action states that “Claim 12 is rejected for the same reasons as discussed in claim 5 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claim 5. Further, Applicants submit that because claim 12 depends from claim 10, and as a dependent claim therefrom, claim 12 is allowable for at least the reasons claim 10 is allowable. Applicants further

submit, argued in part at least immediate above, that claim 12 is also allowable in light of the presence of novel and non-obvious elements contained in claim 12 that are not otherwise present in claim 10.

Dependent Claim 13

The Office Action states that “Claim 13 is rejected for the same reasons as discussed in claim 6 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claim 13. Further, Applicants submit that because claim 13 depends from claim 10, and as a dependent claim therefrom, claim 13 is allowable for at least the reasons claim 10 is allowable. Applicants further submit, argued in part at least immediate above, that claim 13 is also allowable in light of the presence of novel and non-obvious elements contained in claim 13 that are not otherwise present in claim 10.

Dependent Claim 14

The Office Action states that “Claim 14 is rejected for the same reasons as discussed in claim 7 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claim 7. Further, Applicants submit that because claim 14 depends from claim 13, and as a dependent claim therefrom, claim 14 is allowable for at least the reasons claim 13 is allowable. Applicants further submit, argued in part at least immediate above, that claim 14 is also allowable in light of the presence of novel and non-obvious elements contained in claim 14 that are not otherwise present in claim 13.

Dependent Claim 15

The Office Action states that “Claim 15 is rejected for the same reasons as discussed in claim 8 above. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claim 8. Further, Applicants submit that because claim 15 depends from claim 10, and as a dependent claim therefrom, claim 15 is allowable for at least the reasons claim 10 is allowable. Applicants further submit, argued in part at least immediate above, that claim 15 is also allowable in light of the presence of novel and non-obvious elements contained in claim 15 that are not otherwise present in claim 10.

Independent Claim 16 and dependent claims 17-19

The Office Action states that “Claims 16-19 are rejected for the same reasons as discussed in claims 1-4, respectively. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claims 1-4. Further, Applicants submit that because claims 17-19 depend from claim 16, and as a dependent claims therefrom, claims 17-19 are allowable for at least the reasons claim 16 is allowable. Applicants further submit, argued in part at least immediate above, that claims 17-19 are also allowable in light of the presence of novel and non-obvious elements contained in claims 17-19 that are not otherwise present in claim 16.

Dependent Claims 20-23

The Office Action states that “Claims 20-23 are rejected for the same reasons as discussed in claims 6-9, respectively. (Office Action, ¶ 2, pg. 4).

Applicants respectfully reassert the arguments made above regarding claims 6-9. Further, Applicants submit that because claims 20-23 depend from claim 16, and as a dependent claims therefrom, claims 20-23 are allowable for at least the reasons claim 16 is allowable. Applicants further submit, argued in part at least immediate above, that claims 20-23 are also allowable in light of the presence of novel and non-obvious elements contained in claims 20-23 that are not otherwise present in claim 16.

CONCLUSION

For the foregoing reasons, withdrawal of the rejections and allowance of the claims is respectfully requested. If there are any questions or comments regarding this response, the Examiner is encouraged to contact the undersigned at 312-609-7500.

Respectfully submitted,

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